

The invention in which an exclusive right is claimed is defined by the following:

1. A videoendoscopic surgery trainer for practicing videoendoscopic surgical techniques, comprising:

- (a) a housing defining a practice volume; and
- (b) a digital video camera disposed within the practice volume, the digital video camera producing a digital video signal conveying images of at least a portion of the practice volume.

2. The videoendoscopic surgery trainer of Claim 1, wherein the housing is adapted to support an anatomical structure within a lower portion of the practice volume, wherein the digital video camera is positioned within the practice volume relative to an anatomical structure such that images of an anatomical structure obtained using the digital video camera realistically simulate images of an internal surgical field within a patient produced by one of a conventional laparoscopic camera and a conventional endoscopic camera.

3. The videoendoscopic surgery trainer of Claim 1, wherein the housing is configured to enable insertion of elongate medical tools into the practice volume to perform a training exercise within the practice volume by manipulating the elongate medical tools from outside the housing, a position of the digital video camera having been selected so as to not interfere with a range of motion of the elongate medical tools required to successfully perform the training exercise.

4. The videoendoscopic surgery trainer of Claim 1, wherein the digital video camera is movably positionable within the practice volume, such that the position of the digital video camera can be changed to obtain an image of a different portion of the practice volume.

5. The videoendoscopic surgery trainer of Claim 1, wherein the digital video camera is disposed in an upper portion of the practice volume, such that light traveling along a light path from the at least a portion of the practice volume to the digital video camera travels in a generally upward direction.

6. The videoendoscopic surgery trainer of Claim 1, further comprising at least one optical reflector, such that light traveling along a light path from the at least a portion of the practice volume to the digital video camera is directed toward the digital video camera by the at least one optical reflector.

7. The videoendoscopic surgery trainer of Claim 6, wherein the digital video camera is disposed in a lower portion of the practice volume, and wherein at least one optical reflector directs light from the at least a portion of the practice volume to the digital video camera and is disposed in an upper portion of the practice volume.

8. The videoendoscopic surgery trainer of Claim 1, further comprising a support structure, the digital video camera being coupled to and supported by the support structure.

9. The videoendoscopic surgery trainer of Claim 8, wherein the support structure includes a ball head that enables the digital video camera to pan and tilt.

10. The videoendoscopic surgery trainer of Claim 8, wherein the support structure includes a pan and tilt head.

11. The videoendoscopic surgery trainer of Claim 8, wherein the support structure is substantially disposed within the housing.

12. The videoendoscopic surgery trainer of Claim 8, wherein the support structure comprises an elongate member having a proximal end disposed outside the practice volume and a distal end disposed inside the practice volume, the digital video camera being coupled to the distal end of the elongate member.

13. The videoendoscopic surgery trainer of Claim 12, wherein the proximal end of the elongate member comprises a handle configured to simulate a handle of a conventional laparoscope.

14. The videoendoscopic surgery trainer of Claim 12, further comprising a mounting bracket, the mounting bracket being configured to support the elongate member.

15. The videoendoscopic surgery trainer of Claim 14, wherein the mounting bracket is further configured to slidably engage the elongate member, such that an extent to which the elongate member extends within the practice volume is variable as desired.

16. The videoendoscopic surgery trainer of Claim 14, wherein the mounting bracket is further configured to pivotally engage the elongate member, such that a position of the distal end of the elongate member within the practice volume is adjustable.

17. The videoendoscopic surgery trainer of Claim 14, wherein the mounting bracket is further configured to pivotally engage the housing, such that a position of the distal end of the elongate member within the practice volume is adjustable.

18. The videoendoscopic surgery trainer of Claim 14, wherein the housing comprises a top panel through which medical instruments are insertable to gain access to the practice volume.

19. The videoendoscopic surgery trainer of Claim 18, wherein the elongate member passes through the panel via an opening that is substantially smaller than the digital video camera.

20. The videoendoscopic surgery trainer of Claim 1, further comprising a light source coupled with the housing and disposed to illuminate at least a portion of the practice area.

21. The videoendoscopic surgery trainer of Claim 20, wherein the light source is movably coupled to the housing and movable to selectively illuminate different portions of the practice area.

22. The videoendoscopic surgery trainer of Claim 1, wherein the digital video camera is substantially larger than a smallest incision that would be required to insert a laparoscope into a body of a patient.

23. The videoendoscopic surgery trainer of Claim 1, wherein the digital video camera is a web camera.

24. A videoendoscopic surgery trainer for the practice of videoendoscopic surgery techniques, the trainer comprising:

- (a) a housing defining a practice volume;
- (b) a digital video camera disposed within the practice volume, the digital video camera being configured to capture a plurality of frames per second, such that the digital video camera can provide a digital video feed of at least a portion of the practice volume; and
- (c) a support structure comprising an elongate member, the elongate member having a proximal end disposed outside of the practice volume, and a distal end disposed inside the practice volume, the digital video camera being coupled with the distal end of the elongate member, such that a manipulation in a position of the proximal end of the elongate member results in a change in a position of the digital video camera.

25. The videoendoscopic surgery trainer of Claim 24, wherein the support structure comprises a bracket configured to slidingly engage the elongate member, such that an amount of the elongate member disposed within the practice volume can be increased and decreased as desired.

26. The videoendoscopic surgery trainer of Claim 24, wherein the support structure comprises a bracket that enables the elongate member to pan and tilt.

27. A videoendoscopic surgery training system for practicing videoendoscopic surgical techniques, comprising:

- (a) a housing defining a practice volume;
- (b) a digital video camera disposed within the practice volume, the digital video camera producing a digital video signal conveying images of at least a portion of the practice volume;
- (c) a signal processor configured to receive and process the digital video signal from the digital video camera to provide a display video signal that conveys the images; and
- (d) a display for displaying the images conveyed by the display video signal.

28. The videoendoscopic surgery training system of Claim 27, wherein the digital video camera is substantially larger than a smallest incision required to insert a laparoscope into a body of a patient.

29. The videoendoscopic surgery training system of Claim 28, further comprising a support structure configured to positionably support the digital video camera, such that images of the at least a portion of the practice volume produced using the digital video camera realistically simulates images of an internal surgical field produced using one of a conventional laparoscopic camera and a conventional endoscopic camera.

30. The videoendoscopic surgery training system of Claim 29, wherein the support structure includes an elongate member, the elongate member having a proximal end disposed outside of the practice volume and a distal end disposed inside the practice volume, the digital video camera being coupled to the distal end of the elongate member, such that manipulating the proximal end of the elongate member changes a position of the digital video camera.

31. The videoendoscopic surgery training system of Claim 30, wherein the housing comprises a panel through which medical instruments are insertable to access the practice volume, the panel including an opening through which the elongate member passes, the opening being smaller than the digital video camera.

32. The videoendoscopic surgery training system of Claim 30, wherein the support structure comprises a bracket configured to slidably engage the elongate member, such that an extent by which the elongate member extends within the practice volume is variable as desired.

33. The videoendoscopic surgery training system of Claim 30, wherein the support structure enables the digital video camera to pan and tilt.

34. The videoendoscopic surgery training system of Claim 30, further comprising a non volatile memory medium logically coupled with the digital camera and configured to store a copy of the digital video signal for later use.

35. The videoendoscopic surgery training system of Claim 30, wherein the signal processor comprises a computing device having a storage medium used to store the digital video signal for later display.

36. The videoendoscopic surgery training system of Claim 30, wherein the signal processor comprises a computing device, the computing device comprising:

- (a) a processor; and
- (b) a memory in communication with the processor, said memory storing machine instructions that cause the processor to carry out a plurality of functions, including:
  - (i) storing the digital video signal in a non volatile memory;
  - (ii) processing the digital video signal to produce the display video signal; and
  - (iii) transmitting data conveyed by at least one of the digital video signal and the display video signal to another computing device using a network connection.

37. A method for simulating an internal imaging of an endoscopic procedure, comprising the steps of:

(a) providing a surgical trainer, an anatomical structure, and a digital video camera, the digital video camera being disposed within a practice volume in which a simulated endoscopic procedure corresponding to the endoscopic procedure is being performed upon the anatomical structure;

(b) producing a signal conveying images of the anatomical structure with the digital video camera; and

(c) displaying the images of the anatomical structure conveyed by the signal.

38. The method of Claim 37, further comprising the step of converting the signal produce by digital video camera to a display video signal, such that one of an analog display and a digital display is driven by the display video signal to display the images of the simulated endoscopic procedure.

39. The method of Claim 37, wherein the digital video camera is coupled to a distal end of an elongate member, and the step of using the digital video camera to obtain a video feed of the anatomical structure comprises the step of manipulating a proximal end of the elongate member to position the digital video camera relative to the anatomical structure.

40. The method of Claim 37, further comprising the step of illuminating the anatomical structure with a light source.

41. The method of Claim 37, wherein the step of using a digital video camera to produce the signal conveying the images of the anatomical structure comprises the step of reflecting an image of the anatomical structure toward the digital video camera.

42. A method for simulating an internal imaging of an endoscopic procedure, comprising the steps of:

- (a) providing a surgical trainer in which a simulated surgical field is disposed;
- (b) introducing an anatomical structure on which the endoscopic procedure is to be simulated into the surgical trainer;
- (c) positioning a digital video camera within the surgical trainer so as to image the simulated surgical field;
- (d) displaying images of the simulated surgical field produced by the digital video camera; and
- (e) performing the endoscopic procedure on the anatomical structure while viewing the images displaying the progress of said procedure.

43. A method for using a digital camera to enhance endoscopic skills training, comprising the steps of:

- (a) providing a surgical trainer defining a practice volume, the surgical trainer comprising a digital video camera disposed in the practice volume;
- (b) introducing at least one exercise object into the practice volume;
- (c) using the digital video camera to obtain video images of the at least one exercise object;
- (d) displaying video images of the at least one exercise object; and
- (e) manipulating the at least one exercise object while viewing the video images of the at least one exercise object.

44. The method of Claim 43, wherein the at least one exercise object comprises a simulated anatomic structure.



45. The method of Claim 43, further comprising the step of introducing at least one elongate instrument into the practice volume, wherein the step of manipulating the at least one exercise object comprises the step of manipulating the at least one exercise object with the at least one elongate instrument.

46. The method of Claim 43, further comprising the step of moving the digital camera relative to the at least one object.

47. The method of Claim 43, further comprising the step of storing the video images of the at least one exercise object.

48. The method of Claim 43, further comprising the step of transmitting data conveying the video images of the at least one exercise object over a network.